

CLAIMS

1. A stent in a non-expanded state, comprising:
a first expansion column formed of a plurality of first expansion column strut
5 pairs, a first expansion strut pair including a first expansion strut adjacent to a second
expansion strut and a first joining strut that couples the first and second expansion struts
at a proximal end of the first expansion strut pair, a second expansion strut pair including
a third expansion strut adjacent to the second expansion strut and a second joining strut
that couples the second and third expansion struts at a distal end of the second expansion
10 strut pair, a third expansion strut pair including a fourth expansion strut adjacent to the
third expansion strut and a third joining strut that couples the third and fourth expansion
struts at a proximal end of the third expansion strut pair, a fourth expansion strut pair
including a fifth expansion strut adjacent to the fourth expansion strut and a fourth
joining strut that couples the fourth and fifth expansion struts at a distal end of the fourth
15 expansion strut pair, a first expansion strut pair first corner formed where the first joining
strut is coupled to the first expansion strut, and a first expansion strut pair second corner
formed where the first joining strut is coupled to the second expansion strut, and a
second expansion strut pair first corner formed where the second joining strut is coupled
to the second expansion strut, and a second expansion strut pair second corner formed
20 where the second joining strut is coupled to the third expansion strut, and a third
expansion strut pair first corner formed where the third joining strut is coupled to the
third expansion strut, and a third expansion strut pair second corner formed where the
third joining strut is coupled to the fourth expansion strut, and a fourth expansion strut
pair first corner formed where the fourth joining strut is coupled to the fourth expansion
25 strut, and a fourth expansion strut pair second corner formed where the fourth joining
strut is coupled to the fifth expansion strut;
a second expansion column formed of a plurality of second expansion column
strut pairs, a first expansion strut pair including a first expansion strut adjacent to a
second expansion strut and a first joining strut that couples the first and second
30 expansion struts at a proximal end of the first expansion strut pair, a second expansion
strut pair including a third expansion strut adjacent to the second expansion strut and a
second joining strut that couples the second and third expansion struts at a distal end of

the second expansion strut pair, a third expansion strut pair including a fourth expansion strut adjacent to the third expansion strut and a third joining strut that couples the third and fourth expansion struts at a proximal end of the third expansion strut pair, a fourth expansion strut pair including a fifth expansion strut adjacent to the fourth expansion strut and a fourth joining strut that couples the fourth and fifth expansion struts at a distal end of the fourth expansion strut pair, a first expansion strut pair first corner formed where the first joining strut is coupled to the first expansion strut, and a first expansion strut pair second corner formed where the first joining strut is coupled to the second expansion strut, and a second expansion strut pair first corner formed where the second joining strut is coupled to the second expansion strut, and a second expansion strut pair second corner formed where the second joining strut is coupled to the third expansion strut, and a third expansion strut pair first corner formed where the third joining strut is coupled to the third expansion strut, and a third expansion strut pair second corner formed where the third joining strut is coupled to the fourth expansion strut, and a fourth expansion strut pair first corner formed where the fourth joining strut is coupled to the fourth expansion strut, and a fourth expansion strut pair second corner formed where the fourth joining strut is coupled to the fifth expansion strut; and

a first connecting strut column formed of a plurality of first connecting struts, each connecting strut of the first connecting strut column including a connecting strut proximal section, a connecting strut distal section and a connecting strut intermediate section, a first connecting strut proximal section is coupled to the first corner of the second expansion strut pair of the first expansion strut column, and a first connecting strut distal section is coupled to the first joining strut of the first expansion strut pair of the second expansion strut column intermediate the first expansion strut pair first corner and the first expansion strut pair second corner, and a second connecting strut proximal section is coupled to the first corner of the fourth expansion strut pair of the first expansion strut column, and a second connecting strut distal section is coupled to the third joining strut of the third expansion strut pair of the second expansion strut column intermediate the third expansion strut pair first corner and the third expansion strut pair second corner.

2. The stent of claim 1, wherein each connecting strut proximal section has a substantially linear geometry.

3. The stent of claim 2, wherein each connecting strut distal section has a substantially linear geometry.
4. The stent of claim 3, wherein each connecting strut intermediate section has a substantially linear geometry.
- 5 5. The stent of claim 3, wherein each connecting strut intermediate section includes a first linear section and a second linear section.
6. The stent of claim 5, wherein the first linear section of the first connecting strut intermediate section is shorter than the second linear section of the first connecting strut intermediate section.
- 10 7. The stent of claim 5, wherein each of a connecting strut proximal section, distal section, first linear section of the intermediate section and second linear section of the intermediate section have a different longitudinal axis.
8. The stent of claim 5, wherein a first slant angle is formed between the first linear section of the first connecting strut intermediate section and the second linear section of the first connecting strut intermediate section.
- 15 9. The stent of claim 5, further including a radius of curvature formed at the first slant angle.
10. The stent of claim 5, wherein a radius of curvature is formed between the first linear section and the second linear section of the first connecting strut intermediate section.
- 20 11. The stent of claim 5, wherein a second slant angle is formed between the second linear section of the first connecting strut intermediate section and the distal section of the first connecting strut.
12. The stent of claim 5, wherein a radius of curvature is formed between the second linear section of the first connecting strut intermediate section and the distal section of the first connecting strut.
- 25 13. The stent of claim 5, wherein a third slant angle is formed between the proximal section of the first connecting strut and the first linear section of the first connecting strut intermediate section.
- 30 14. The stent of claim 5, wherein a radius of curvature is formed between the proximal section of each connecting strut and the first linear section of each connecting strut intermediate section.

15. The stent of claim 1, wherein a ratio of a number of expansion struts in an expansion strut column to a number of connecting struts in a connecting strut column is 2 to 1.
16. The stent of claim 1, wherein the stent includes m first and second expansion columns, n connecting struts per column and $n(m-1)/2$ connecting struts.
17. The stent of claim 1, wherein the first and second expansion columns are each unbroken, continuous column structures.
18. The stent of claim 1, wherein one of the first or second expansion column is a broken column structure.
- 10 19. The stent of claim 1, further comprising:
a plurality of first expansion columns;
a plurality of second expansion columns; and
a plurality of first connecting strut columns, each first connecting strut column coupling a first expansion column to a second expansion column.
- 15 20. The stent of claim 19, wherein the plurality of first expansion columns, the plurality of second expansion columns and the plurality of first connecting strut columns form an elongated structure.
21. The stent of claim 1, wherein the first expansion column, the second expansion column, and the first connecting strut column form a plurality of geometric cells and at least a portion of the plurality are symmetrical geometric cells.
- 20 22. The stent of claim 1, wherein the first expansion column, the second expansion column, and the first connecting strut column form non-uniform cell space patterns.
23. The stent of claim 1, wherein the first expansion strut column, the second expansion strut column and the first connecting strut column form asymmetrical geometric configurations.
- 25 24. The stent of claim 1, further comprising:
a reinforcement expansion column made of a plurality of reinforcement expansion struts, wherein each reinforcement expansion strut has a width that is greater than a width of an expansion strut in the first or second expansion, columns.
- 30 25. The stent of claim 1, wherein the stent has a proximal end with a first reinforcement expansion column and a distal end with a second reinforcement expansion column.

26. The stent of claim 1, wherein the stent has a reenforcement expansion column between a proximal end and a distal end of the stent.

27. The stent of claim 1, further comprising:

a third expansion column formed of a plurality of third expansion column strut
5 pairs, a first expansion strut pair including a first expansion strut adjacent to a second
expansion strut and a first joining strut that couples the first and second expansion struts
at a proximal end of the first expansion strut pair, a second expansion strut pair including
a third expansion strut adjacent to the second expansion strut and a second joining strut
that couples the second and third expansion struts at a distal end of the second expansion
10 strut pair, a third expansion strut pair including a fourth expansion strut adjacent to the
third expansion strut and a third joining strut that couples the third and fourth expansion
struts at a proximal end of the third expansion strut pair, a fourth
expansion strut pair including a fifth expansion strut adjacent to the fourth expansion strut
and a fourth joining strut that couples the fourth and fifth expansion struts at a distal end
15 of the fourth expansion strut pair, a first expansion strut pair first corner formed where
the first joining strut is coupled to the first expansion strut, and a first expansion strut
pair second corner formed where the first joining strut is coupled to the second expansion
strut, and a second expansion strut pair first corner formed where the second joining strut
is coupled to the second expansion strut, and a second expansion strut pair second corner
20 formed where the second joining strut is coupled to the third expansion strut, and a third
expansion strut pair first corner formed where the third joining strut is coupled to the
third expansion strut, and a third expansion strut pair second corner formed where the
third joining strut is coupled to the fourth expansion strut, and a fourth expansion strut
pair first corner formed where the fourth joining strut is coupled to the fourth expansion
25 strut, and a fourth expansion strut pair second corner formed where the fourth joining
strut is coupled to the fifth expansion strut; and

a second connecting strut column formed of a plurality of second connecting
struts, each connecting strut of the second connecting strut column including a
connecting strut proximal section, a connecting strut distal section and a connecting strut
30 intermediate section, a first connecting strut proximal section is coupled to the second
corner of the second expansion strut pair of the second expansion strut column, and a
first connecting strut distal section is coupled to the first joining strut of the first

expansion strut pair of the third

expansion strut column intermediate the first expansion strut pair first corner and the first expansion strut pair second corner, and a second connecting strut proximal section is

coupled to the second corner of the fourth expansion strut pair of the second expansion
5 strut column, and a second connecting strut distal section is coupled to the third joining
strut of the third expansion strut pair of the third expansion strut column intermediate the
third expansion strut pair first corner and the third expansion strut pair second corner.

28. The stent of claim 1, wherein a width of the first connecting strut is equal to or
less than a width of the first expansion strut of the first or second expansion columns.

10 29. The stent of claim 1, wherein a width of a connecting strut of the first connecting
strut column is larger than a width of a first expansion strut of the first or second
expansion columns.

30. The stent of claim 1, wherein a width of the second expansion strut of the first or
second expansion columns is substantially the same as the width of the first expansion
15 strut of the first or second expansion columns.

31. The stent of claim 1, wherein a space between the first and second expansion
struts of the first expansion column is equal to a space between the second and third
expansion struts of the first expansion column.

32. The stent of claim 1, wherein a space between the first and second expansion
20 struts of the first expansion column is less than a space between the second and third
expansion struts of the first expansion column.

33. The stent of claim 1, wherein a space between the first and second expansion
struts of the first expansion column is larger than a space between the second and third
expansion struts of the first expansion column.

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add a2
7 add B³